

WHAT IS CLAIMED IS:

1. A sample archive system comprising:
 - 5 a plurality of sample carriers configured to support a plurality of sample nodes in a predetermined spatial relationship;
 - sample storage means for selectively placing said plurality of sample carriers in an archive; and
 - sample node removal means for locating and removing selected ones of said plurality of sample nodes.
- 10 2. The system of claim 1 wherein said sample node removal means comprises a laser.
3. The system of claim 1 wherein said sample node removal means comprises a mechanical clipping tool.
4. The system of claim 1 further comprising an optical component operative to
15 detect the location of said selected ones of said plurality of sample nodes.
5. The system of claim 4 further comprising a positioning component operative to position said sample node removal means responsive to signals transmitted by said optical component.
6. A sample archive system comprising:
 - 20 a plurality of sample carrier receptacles; each of said plurality of sample carrier receptacles configured to receive one or more sample carriers supporting a plurality of sample nodes;
 - a sample carrier storage device operative to place selected ones of said one or more sample carriers in selected ones of said plurality of
25 sample carrier receptacles;
 - a sample carrier location device operative to locate said selected ones of said one or more sample carriers;
 - a sample carrier retrieval device operative to retrieve said selected ones of said one or more sample carriers from ones of said plurality of
30 sample carrier receptacles; and

sample node removal means for identifying and removing selected ones of said plurality of sample nodes.

7. The system of claim 6 wherein at least a portion of said plurality of sample carrier receptacles includes a rack.
- 5 8. The system of claim 6 wherein at least a portion of said plurality of sample carrier receptacles includes a drawer.
9. The system of claim 6 wherein said sample carrier location device is a bar code reader.
- 10 10. The system of claim 6 wherein said sample node removal means comprises a laser.
11. The system of claim 6 wherein said sample node removal means comprises a mechanical clipping tool.
12. The system of claim 10 wherein said sample node removal means further comprises an optical component operative to detect the location of said selected ones of said plurality of sample nodes.
- 15 13. The system of claim 12 wherein said sample node removal means further comprises a positioning component operative to position said laser responsive to signals transmitted by said optical component.
14. The system of claim 6 further comprising means for processing a sample supported by said selected ones of said plurality of sample nodes.
- 20 15. The system of claim 6 further comprising a controller for controlling operation of said sample carrier storage device and said sample carrier retrieval device.
16. A sample archive system comprising:
 - 25 an archive comprising a plurality of sample carrier receptacles; each of said plurality of sample carrier receptacles configured to receive one or more sample carriers supporting a plurality of sample nodes; and

a robotics system comprising mechanisms operative to store and to retrieve selected ones of said one or more sample carriers from said archive.

17. The system of claim 16 further comprising a sample carrier locator coupled to said robotics system and operative to detect a location of said selected ones of said one or more sample carriers.
18. The system of claim 17 wherein said sample carrier locator comprises an optical sensor.
19. The system of claim 18 wherein said robotics system is automatically responsive to signals from said sample carrier locator.
20. The system of claim 16 further comprising a sample node removal device operative to identify and to remove selected ones of said plurality of sample nodes from selected ones of said one or more sample carriers.
21. The system of claim 20 further comprising a sample node locator coupled to said sample node removal device and operative to detect a location of said selected ones of said plurality of sample nodes.
22. The system of claim 21 wherein said sample node removal device is automatically responsive to signals from said sample node locator.
23. The system of claim 21 wherein said sample node locator comprises a respective transceiver incorporated in each of said plurality of sample nodes.
24. The system of claim 21 wherein said sample node locator comprises an optical sensor.
25. The system of claim 16 wherein at least a portion of said plurality of sample carrier receptacles includes a rack.
26. The system of claim 16 wherein at least a portion of said plurality of sample carrier receptacles includes a drawer.
27. The system of claim 18 wherein said sample carrier locator is a bar code reader.
28. The system of claim 20 wherein said sample node removal device comprises a mechanical clipping tool and a mechanical positioning system to position

said mechanical clipping tool relative to said selected ones of said plurality of sample nodes.

29. The system of claim 20 wherein said sample node removal device comprises a laser and a mechanical positioning system to position said laser relative to said selected ones of said plurality of sample nodes.
30. The system of claim 20 further comprising means for processing a sample supported by said selected ones of said plurality of sample nodes.
31. The system of claim 20 further comprising a computer operative to control said robotics system and said sample node removal device.
32. The system of claim 24 wherein said sample node removal device comprises a mechanical clipping tool and a mechanical positioning system to position said mechanical clipping tool relative to said selected ones of said plurality of sample nodes responsive to signals transmitted by said optical sensor.
33. The system of claim 24 wherein said sample node removal device comprises a laser and a mechanical positioning system to position said laser relative to said selected ones of said plurality of sample nodes responsive to signals transmitted by said optical sensor.
34. A method of archiving samples; said method comprising:
selectively transferring a specimen to a plurality of discrete sample nodes attached to a sample carrier;
archiving said sample carrier in an archive facility; and
recording the location of said sample carrier in said archive facility.
35. The method of claim 34 further comprising washing said plurality of discrete sample nodes subsequent to said selectively transferring.
36. The method of claim 34 further comprising assigning identifying indicia for said sample carrier in accordance with said recording.
37. The method of claim 36 wherein said indicia comprises a bar code.
38. The method of claim 34 wherein said recording comprises writing data records associated with said plurality of discrete sample nodes to a computer readable data storage medium.

39. The method of claim 34 further comprising allowing said plurality of discrete sample nodes to desiccate subsequent to said selectively transferring.
40. The method of claim 34 further comprising selectively applying a preservative to said plurality of discrete sample nodes subsequent to said selectively transferring.
- 5 41. The method of claim 34 wherein said specimen is protein.
42. The method of claim 34 wherein said specimen is a polynucleotide.
43. The method of claim 42 wherein said polynucleotide is DNA.
44. The method of claim 34 wherein said specimen is non-biological.
- 10 45. A method of archiving samples; said method comprising:
- obtaining a specimen from a source;
- associating an identifier to said source and to said specimen;
- writing said identifier and information associated with said source and said specimen to a data structure;
- 15 46. The method of claim 45 further comprising recording the location of said sample carrier in said archive facility.
- 20 47. The method of claim 45 wherein said specimen is protein.
48. The method of claim 45 wherein said specimen is a polynucleotide.
49. The method of claim 48 wherein said polynucleotide is DNA.
50. The method of claim 45 wherein said specimen is non-biological.
- 25 51. The method of claim 45 further comprising acquiring consent to obtain said specimen.
52. The method of claim 45 further comprising washing said plurality of discrete sample nodes subsequent to said selectively transferring.

53. The method of claim 45 further comprising assigning identifying indicia for said sample carrier in accordance with said associating and said selectively transferring.
54. The method of claim 53 wherein said indicia comprises a bar code.
- 5 55. The method of claim 46 wherein said recording comprises writing data records associated with said plurality of discrete sample nodes to a computer readable data storage medium.
56. The method of claim 45 further comprising allowing said plurality of discrete sample nodes to desiccate subsequent to said selectively transferring.
- 10 57. The method of claim 45 further comprising selectively applying a preservative to said plurality of discrete sample nodes subsequent to said selectively transferring.
58. A computer readable medium encoded with data and computer executable instructions; the data and instructions causing an apparatus executing the instructions to:
- 15
- receive information regarding a sample and a source of said sample;
assign an identifier to said sample, said source, and said information;
record said identifier and said information in a data structure; and
record the location within a sample carrier of each of a plurality of
- 20
- discrete sample nodes supporting said sample.
59. The computer readable medium of claim 58 further encoded with data and computer executable instructions and further causing an apparatus to transmit control signals to a remote device at an archive facility.
60. The computer readable medium of claim 58 further encoded with data and computer executable instructions and further causing an apparatus to transmit control signals to a sample node removal device operative to locate and to remove selected ones of said plurality of discrete sample nodes.
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61. The computer readable medium of claim 58 further encoded with data and computer executable instructions and further causing an apparatus to transmit

control signals to a sample carrier storage device operative to place selected ones of a plurality of sample carriers in an archive.

62. The computer readable medium of claim 61 further encoded with data and computer executable instructions and further causing an apparatus to transmit control signals to a sample carrier retrieval device operative to retrieve said selected ones of said plurality of sample carriers from said archive.

63. A method of preparing an archive sample for analysis; said method comprising:

identifying a sample to be analyzed;

responsive to said identifying, ascertaining a location of said sample on a discrete sample node supported by a sample carrier;

responsive to said ascertaining, removing said discrete sample node from said sample carrier; and

preparing said sample for analysis.

64. The method of claim 63 wherein said identifying comprises interrogating a data structure.

65. The method of claim 63 wherein said ascertaining comprises utilizing an optical sensor.

66. The method of claim 63 wherein said ascertaining comprises reading a bar code.

67. The method of claim 63 wherein said ascertaining comprises identifying a unique signal transmitted from a transceiver attached to said discrete sample node.

68. The method of claim 67 wherein said removing comprises transmitting a control signal to said transceiver.

69. The method of claim 63 wherein said removing comprises utilizing a laser.

70. The method of claim 63 wherein said removing comprises utilizing a mechanical clipping tool.

71. The method of claim 63 wherein said preparing comprises depositing said discrete sample node in a sample container.

72. The method of claim 63 wherein said preparing comprises washing sample material attached to said discrete sample node.
73. The method of claim 63 wherein said sample is non-biological.
74. The method of claim 63 wherein said sample is biological.
- 5 75. The method of claim 74 wherein said sample is a polynucleotide.
76. The method of claim 75 wherein said preparing comprises amplifying said polynucleotide.
77. A method of preparing an archive sample for analysis; said method comprising:
- 10 receiving a request related to an experiment;
identifying a sample suitable for said experiment;
responsive to said receiving and said identifying, locating a sample carrier supporting said sample on a discrete sample node;
detecting a location of said discrete sample node on said sample
- 15 carrier;
removing said discrete sample node from said sample carrier; and
preparing said sample for analysis.
78. The method of claim 77 wherein said locating comprises interrogating a database maintaining records related to said sample carrier.
- 20 79. The method of claim 77 wherein said locating comprises utilizing an optical sensor.
80. The method of claim 77 wherein said locating comprises reading a bar code.
81. The method of claim 77 wherein said detecting comprises obtaining video signals output from an optical sensor.
- 25 82. The method of claim 81 wherein said removing comprises automatically operating a sample node removal device responsive to said obtaining video signals.
83. The method of claim 81 wherein said removing comprises manually operating a sample node removal device.

84. The method of claim 77 wherein said detecting comprises identifying a unique signal transmitted from a transceiver attached to said discrete sample node.
85. The method of claim 84 wherein said removing comprises transmitting a control signal to said transceiver.
86. The method of claim 77 wherein said removing comprises utilizing a laser.
87. The method of claim 77 wherein said removing comprises utilizing a mechanical clipping tool.
88. The method of claim 77 wherein said preparing comprises depositing said discrete sample node in a sample container.
89. The method of claim 77 wherein said preparing comprises washing sample material attached to said discrete sample node.
90. The method of claim 77 wherein said sample is non-biological.
91. The method of claim 77 wherein said sample is biological.
92. The method of claim 91 wherein said sample is a polynucleotide.
93. The method of claim 92 wherein said preparing comprises amplifying said polynucleotide.
94. A sample node removal system comprising:
a sample carrier configured to support a plurality of sample nodes in a predetermined spatial relationship; and
node removal means for locating and removing selected ones of said plurality of sample nodes.
95. The system of claim 94 wherein said node removal means comprises a laser.
96. The system of claim 94 wherein said node removal means comprises a mechanical clipping tool.
97. The system of claim 94 further comprising an optical component operative to detect the location of said selected ones of said plurality of sample nodes.
98. The system of claim 97 further comprising a positioning component operative to position said node removal means responsive to signals transmitted by said optical component.

99. The system of claim 98 further comprising a computer operative to receive said signals and to control said positioning component and said node removal means.
100. The system of claim 95 wherein said sample node removal means further
5 comprises a mechanical positioning system to position said laser relative to said selected ones of said plurality of sample nodes.
101. The system of claim 96 wherein said sample node removal means further comprises a mechanical positioning system to position said mechanical clipping tool relative to said selected ones of said plurality of sample nodes.
102. A method of preparing an archive sample for analysis; said method
10 comprising:
- identifying a sample to be analyzed;
responsive to said identifying, obtaining said sample;
preparing said sample for analysis; and
15 selectively repeating said identifying, said obtaining, and said preparing at a rate sufficient to prepare in excess of 100 samples for analysis per day.
103. The method of claim 102 wherein said identifying comprises interrogating a database.
104. The method of claim 102 wherein said identifying comprises utilizing an
20 optical sensor.
105. The method of claim 102 wherein said obtaining comprises automatically operating a sample node removal device.
106. The method of claim 105 wherein said obtaining comprises utilizing a laser.
107. The method of claim 105 wherein said obtaining comprises utilizing a
25 mechanical clipping tool.
108. The method of claim 102 wherein said preparing comprises depositing said sample in a sample container.
109. The method of claim 102 wherein said preparing comprises washing said
30 sample.

110. The method of claim 102 wherein said sample is non-biological.
111. The method of claim 102 wherein said sample is biological.
112. The method of claim 111 wherein said sample is a polynucleotide.
113. The method of claim 112 wherein said preparing comprises amplifying said
5 polynucleotide.
114. The method of claim 111 wherein said selectively repeating occurs at a rate
sufficient to prepare in excess of 200 samples for analysis per day.
115. The method of claim 111 wherein said selectively repeating occurs at a rate
sufficient to prepare in excess of 500 samples for analysis per day.